**Geometric Patterns**  Name:

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**Part 1**

Here’s a cool squares pattern:

**Step 1 Step 2 Step 3**

1. Study the pattern above.

* What changes? What stays the same?
* What would **step 4** of the pattern look like? Draw it here. How many squares would there be?

2. How many squares would be in **step 10**? Show all of your thinking below.

3. How many squares would be in **step 50**? Show all of your thinking below.

4. Now, describe how you can find the number of squares in **any step number.**

What this means: what if you were asked to find the number of squares in step 500? You don’t want to draw that many squares! What can be a faster way to do it?

**Part 2**

1. Here are the first three steps of a pattern. Do the following for this pattern:

* 1. Describe the structure of the pattern. In other words, how is it set up? How does it change?
  2. Draw the 4th step.
  3. How many squares are in the 20th step?
  4. Can you describe a process for determining the number of squares in **any step**? (see #4 from above!)



Step 1 Step 2 Step 3

2. Here are the first three steps of another pattern.

1. Describe the structure of the pattern. In other words, how is it set up? How is it changing?
2. Draw the 4th step.
3. How many squares are in the 20th step?
4. Can you describe a process for determining the number of squares in **any given step**?



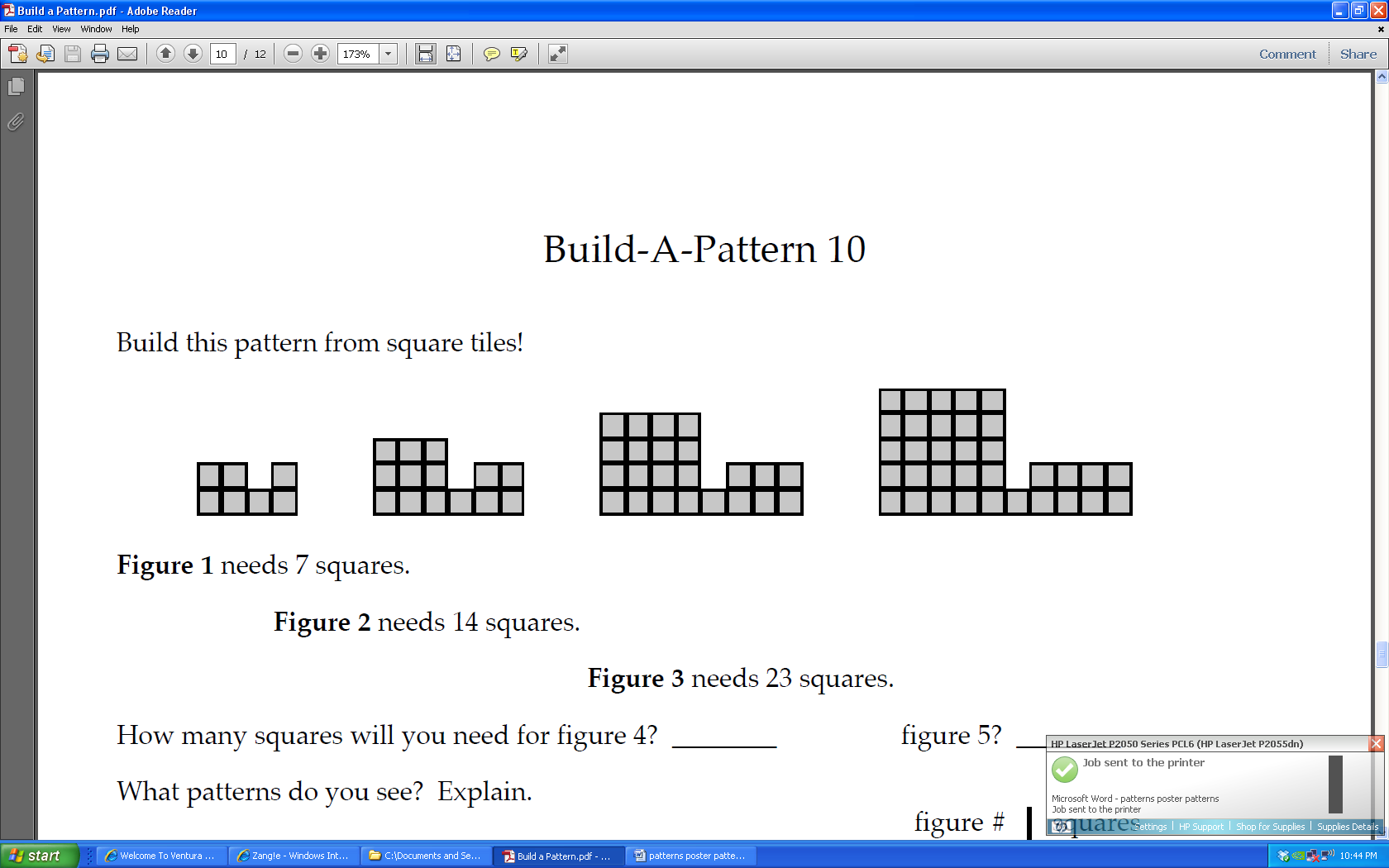
Step 1

Step 2

Step 3

3. Here are the first three steps of another pattern.

1. Describe the structure of the pattern. In other words, how is it set up? How is it changing?
2. Draw the 4th step.
3. How many squares are in the 20th step?
4. Can you describe a process for determining the number of squares in **any given step**?



Step 1 Step 2 Step 3

4.

Step 1 Step 2 Step 3

Above are the first three steps of a pattern.

1. Describe the structure of the pattern. In other words, how is it set up? How is it changing?
2. How many dots would be in the **10th** step?
3. How many dots would be in the **30th** step?
4. Can you describe a process for counting the number of dots in **any given step**?

5.

Step 1 Step 2 Step 3

Above are the first three steps of a pattern.

1. Describe the structure of the pattern. In other words, how is it set up? How is it changing?
2. How many dots would be in the **10th** step?
3. How many dots would be in the **30th** step?
4. Can you describe a process for counting the number of dots in **any given step**?